1.0 PROGRAM MANAGEMENT

1.1 Background

The Solar TErrestrial RElations Observatory (STEREO) Program is part of NASA's Sun-Earth Connection Program. The program aims to improve our understanding of the origins of solar variability and its effect on Earth climate and weather. STEREO is the third of five Solar-Terrestrial Probes called for under NASA's Space Science Enterprise Strategic Plan. STEREO's objective is to:

> *"understand the origin and consequences of Coronal Mass Ejections (CMEs). CMEs are the most energetic eruptions on the Sun. They are responsible for essentially all of the largest solar energetic particle events and are the primary cause of major geomagnetic storms"*[1]

In order to address this objective and answer questions concerning the origin and propagation of CMEs, the Science Definition Team (SDT) has proposed the launch of two instrumented spacecraft, both in heliocentric orbit. One spacecraft would lag the Earth in its orbit the other would lead. These vantage points would allow three-dimensional imaging of solar activity, CME generation and propagation.

The Johns Hopkins University Applied Physics Laboratory (hereafter referred to as APL) has been funded in Pre-Phase A to complete a conceptual design of the spacecraft and mission that would meet the objective outlined above. This report is was initially intended to coincide with the completion of Pre-Phase A and entry into Phase A. However, due to an extension of Pre-Phase A, this report will provide a summary of the conceptual design effort completed to date. Areas that have not been addressed adequately are carried under the risk section and will be focused upon during the remainder of Pre-Phase A.

1.2 Roles and Responsibilities

Goddard Space Flight Center (GSFC) is the NASA Center responsible for implementation of the STEREO mission. It is intended that APL and GSFC will work as partners in implementing this mission. This partnering relationship is expected to extend to all levels of the STEREO program. In order to foster communication, it is expected that GSFC will be apprised of APL's status both formally and informally, on a regular basis. This includes regular attendance of APL team meetings as well as the more formal reviews. It is also expected that APL Mission Operations personnel will routinely meet with GSFC Science Operations personnel so as to develop a ground system that supports the mission requirements. Table 1-1 shows the partitioning of roles and responsibilities between APL and Goddard Space Flight Center.

1.3 Report Overview

This report is broken into six sections plus appendices. The goal is to provide a top-down overview of APL's effort including system and subsystem engineering, mission design, integration and test and mission operations. The report addresses requirements, implementation and identifies areas that need particular attention at the system and subsystem level. The appendices are used to provide additional documentation as well as governing documents that are germane to the program.

This document is intended to provide a snapshot in time and is not a final report. The design will continue to be iterated and will not be finalized until the Critical Design Review.

1.4 Cost and Schedule

Cost and schedule information is provided under a separate cover.

[1] The Sun and Heliosphere in Three Dimensions, Report of the NASA Science Definition Team for the STEREO Mission, 1 December 1997.

Table 1-1 Partnering Approach

(GSFC Draft STEREO Mission Requirements Document)

Function	APL	GSFC
Program Mission Manager		Lead
Project Mission Manager	Lead	
Project Scientist	Assist	Lead
System Engineer	Lead	Assist
Spacecraft Engineering	Lead	
Subsystem Engineering	Spacecraft Lead	Instrument Lead
Integration Engineering	System Lead	
Ground System Engineering	Lead	Assist
Science Operations	Assist	Lead
Mission Operations	Lead	Assist
Launch Vehicle Acquisition	Assist	Lead